Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of the claims in the application.

Listing of Claims

1. (currently amended) A method of decoupling a time-multiplexed data stream of overhead bytes from a time-multiplexed stream of data having a variable data rate, said time-multiplexed stream of data consisting of overhead bytes and data bytes for a given path, said method comprising:

a) finding a minimum possible overhead spacing between any two consecutive unaligned floating overhead bytes in said stream of data;

b) determining a minimum interface rate by dividing said variable data rate of said stream of data by said ~~based on a~~ minimum overhead spacing; ~~, between any two consecutive overhead bytes in said given data path and on a data rate of said stream of data, said data rate being a variable data rate; and said stream of data having unaligned floating overhead bytes;~~ and

c) interfacing between said time-multiplexed data stream of overhead bytes and said stream of data based on said minimum interface rate such that an operation of extracting overhead bytes from the stream of data is performed at a frequency that ~~is at least equal to said minimum interface rate~~ allows the overhead bytes to be extracted from the stream of data just before the next overhead byte for the given data path arrives in the stream of data.

2. (currently amended) The method as claimed in claim 1, wherein said operation in said interfacing step further includes:

~~b1~~ c1) transmitting to an external device said overhead bytes in a next available timeslot within a selected timeslot sequence; and

~~b2~~ c2) signalling to said external device transmission in step ~~b1)~~ c1) of said overhead bytes in said next available timeslot.

3. (currently amended) The method as claimed in claim ~~1~~ 23, wherein said operation in said interfacing step further includes:

~~b1~~ c1) requesting said overhead byte from an external device in a next available timeslot within a selected timeslot sequence; and

~~b2~~ c2) if issued from said external device, receiving said overhead byte along said stream of data and receiving an indication of validity of said overhead byte received for insertion from said external device.

4. (cancelled).

5. (original) The method as claimed in claim 1, wherein said frequency of operation is synchronized for a single clock domain.

6. (currently amended) The method as claimed in claim ~~1~~ 23, further including a step of delaying said operation in step ~~b)~~ c) for a number of clock cycles to accommodate for any external latency through use of pipelining stages.

7. (currently amended) A data network interface device for decoupling a time-multiplexed data stream of overhead bytes from a time-multiplexed stream of data having a variable data rate, said time-multiplexed stream of data consisting of overhead bytes and data bytes for a given path, said interface device comprising:

an overhead processing unit for processing said overhead data bytes, including finding a minimum possible overhead spacing between any two unaligned floating consecutive overhead bytes in said stream of data, and ~~for~~ determining a minimum interface rate by dividing said variable data rate of said stream of data by said ~~based on a~~ minimum overhead spacing ~~between any two consecutive overhead bytes in said given data path and on a data rate of said stream of data, said data rate being a variable data rate and said stream of data having unaligned floating overhead bytes~~, said processing unit having:

an extraction interface for transmitting to an external device said overhead bytes in a next available timeslot within a selected timeslot sequence, and signalling to said external device transmission of said overhead bytes in said next available timeslot; and

an insertion interface for requesting said overhead byte from an external device in a next available timeslot within a selected timeslot sequence, and for receiving said overhead byte along said stream of data, and for receiving an indication of validity of said overhead byte received from said external device;

wherein said interface device maintains a frequency of operation for said extraction interface and said insertion interface that ~~is at least equal to said minimum interface rate~~, allows overhead bytes to be extracted from the stream of data just before the next overhead byte for the given data path arrives in the stream of data, and inserted into the stream of data just before the next overhead byte opportunity arrives in the stream of data.

8. (previously presented) The data network interface device as claimed in claim 7, further comprising a storage device for buffering bursts of data streams arriving at either said insertion interface or said extraction interface.

9. (previously presented) The data network interface device as claimed in claim 7, wherein said overhead byte is a path overhead (POH) byte.

10. (previously presented) The data network interface device as claimed in claim 7, wherein said overhead byte is a transport overhead (TOH) byte in a Synchronous Optical Network (SONET) system.

11. (previously presented) The data network interface device as claimed in claim 7, wherein said overhead byte is a section overhead (SOH) byte in a Synchronous Digital Hierarchy (SDH) system.

12. (previously presented) The data network interface device as claimed in claim 7, wherein said data network interface device provides pipelining stages that models any external device latency by an equivalent number of clock cycles to align receipt of said overhead byte with said indication of validity transmitted from said external device to said insertion interface.

13. (previously presented) The data network interface device as claimed in claim 7, wherein said data network interface device provides a minimum amount of storage to absorb a data burst of said stream of data in either extraction mode or insertion mode.

14. (previously presented) The data network interface device as claimed in claim 7, wherein said data network interface device includes a programmable calendar for dividing and

assigning a portion of a total data rate of said data network interface device to a specific stream of data.

15. (previously presented) The data network interface device as claimed in claim 7, wherein said network interface device includes a plurality of interface devices for decoupling multiple channels, and wherein each of said plurality of interface devices includes a parallel clock that is synchronized for a single clock domain.

16. (previously presented) The data network interface device as claimed in claim 7, wherein said network interface device includes a plurality of interface devices for decoupling multiple channels, and wherein each of said plurality of interface devices includes a parallel clock that is provided with different clock domains such that each of said plurality of interface devices maintains a minimum frequency of operation that provides sufficient headroom to accommodate for signal clock variations and cross-clock domain signalling latency.

17. (currently amended) A computer-readable medium having stored thereon machine executable instructions that when executed implement a method of decoupling a time-multiplexed data stream of overhead bytes from a time-multiplexed stream of data having a variable data rate, said time-multiplexed stream of data consisting of overhead bytes and data bytes for a given path, said method comprising:

a) finding a minimum possible overhead spacing between any two consecutive unaligned floating overhead bytes in said stream of data;

b) determining a minimum interface rate by dividing said variable data rate of said stream of data by said ~~based on a~~ minimum overhead spacing; ~~between any two consecutive overhead bytes in said given data path and on a data rate of said stream of data, said data rate being a variable data rate and said stream of data having unaligned floating overhead bytes;~~ and

b) interfacing between said time-multiplexed data stream of overhead bytes and said stream of data based on said minimum interface rate such that an operation of extracting overhead bytes from the stream of data is performed at a frequency that ~~is at least equal to said minimum interface rate~~ allows the overhead bytes to be extracted just before the next overhead byte for the given data path arrives in the stream of data.

18. (currently amended) The computer-readable medium as claimed in claim 17, wherein said operation in said interfacing step further includes:

~~b1~~ c1) transmitting to an external device said overhead bytes in a next available timeslot within a selected timeslot sequence; and

~~b2~~ c2) signalling to said external device transmission in step ~~b1)~~ c1) of said overhead bytes in said next available timeslot.

19. (currently amended) The computer-readable medium as claimed in claim ~~17~~ 24, wherein said operation in said interfacing step further includes:

~~b1~~ c1) requesting said overhead byte from an external device in a next available timeslot within a selected timeslot sequence; and

~~b2~~ c2) if issued from said external device, receiving said overhead byte along said stream of data and receiving an indication of validity of said overhead byte received for insertion from said external device.

20. (cancelled).

21. (previously presented) The computer-readable medium as claimed in claim 17, wherein said frequency of operation is synchronized for a single clock domain.

22. (currently amended) The computer-readable medium as claimed in claim ~~17~~ 24, further including a step of delaying said operation in step ~~b)~~ c) a number of clock cycles to accommodate for any external latency through use of pipelining stages.

23. (new) A method of decoupling a time-multiplexed data stream of overhead bytes from a time-multiplexed stream of data having variable data rate, said time-multiplexed stream of data consisting of overhead bytes and data bytes for a given path, said method comprising:

a) finding a minimum possible overhead spacing between any two consecutive unaligned floating overhead bytes in said stream of data;

b) determining a minimum interface rate by dividing said variable data rate of said stream of data by said minimum overhead spacing; and

c) interfacing between said time-multiplexed data stream of overhead bytes and said stream of data based on said minimum interface rate such that an operation of inserting

overhead bytes into the stream of data is performed at a frequency that allows the overhead bytes to be inserted just before the next overhead byte opportunity arrives in the stream of data.

24. (new) A computer-readable medium having stored thereon machine executable instructions that when executed implement a method of decoupling a time-multiplexed data stream of overhead bytes from a time-multiplexed stream of data having a variable data rate, said time-multiplexed stream of data consisting of overhead bytes and data bytes for a given path, said method comprising:

a) finding a minimum possible overhead spacing between any two consecutive unaligned floating overhead bytes in said stream of data;

b) determining a minimum interface rate by dividing said variable data rate of said stream of data by said minimum overhead spacing; and

c) interfacing between said time-multiplexed data stream of overhead bytes and said stream of data based on said minimum interface rate such that an operation of inserting overhead bytes into the stream of data is performed at a frequency that allows the overhead bytes to be inserted just before the next overhead byte opportunity arrives in the stream of data.

25. (new) The method as claimed in claim 1, wherein the frequency of operation is determined based on the minimum interface data rate and a cross clock domain signalling latency.

26. (new) The data network interface device as claimed in claim 7, wherein the frequency of operation is determined based on the minimum interface data rate and a cross clock domain signalling latency.

27. (new) The computer-readable medium as claimed in claim 17, wherein the frequency of operation is determined based on the minimum interface data rate and a cross clock domain signalling latency.

28. (new) The method as claimed in claim 23, wherein the frequency of operation is determined based on the minimum interface data rate and a cross clock domain signalling latency.

29. (new) The computer-readable medium as claimed in claim 24, wherein the frequency of operation is determined based on the minimum interface data rate and a cross clock domain signalling latency.